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Remarks

Independent claim 79 has been amended to recite "An electronic device on a plastic substrate, at least one side of the device being protected from reaction with or incorporation of moisture by a composite barrier comprising multiple layers of transparent conductive oxide separated by one or more layers of organic dielectric polymer."

Independent claim 84 has been amended to recite "An electronic device on a substrate, comprising a water vapor-resistant barrier over at least one of the substrate or device, the barrier comprising multiple layers of transparent conductive oxide, transparent metal, or transparent conductive metal nitride, separated by at least one layer of organic dielectric polymer." Antecedent basis for these amendments may be found in the Second Substitute Specification at, e.g., page 4, line 28, page 5, lines 7 – 9 and page 8, line 17 through page 9, line 12. Dependent claims 81, 82, 85 – 92, 94 – 101, 108, 110 – 112 and 114 have also been amended. These latter amendments are editorial in nature or have antecedent basis in the Second Substitute Specification at, e.g., page 18, lines 5 – 7 (claim 82), page 9, lines 28 – 35 (claim 86), page 12, lines 11 – 16 (claim 90), page 6, lines 8 – 15 and page 10, lines 7 – 10 (claim 91), page 4, line 28, page 5, lines 7 – 9 and page 8, line 17 through page 9, line 12 and Fig. 1 (claims 95 and 100), page 14, lines 22 – 25 (claims 98 and 99) and page 11, lines 22 – 26, page 14, lines 22 – 25 (claim 101) and page 8, lines 18 – 19 (claim 108).

New claim 146 has been added. Support for this claim can be found at, e.g., page 2, lines 12 – 15. This added claim would read on the elected light emissive device species, and should be examined together with the currently-examined claims.

Following entry of this amendment, claims 79 – 101, 104 – 108, 110 – 114 and 146 will be pending and not withdrawn in this application.

Applicant describes electronic devices having barriers against transmission of moisture or oxygen. Applicant's barriers can exhibit exceptionally low moisture or oxygen transmission rates, in some cases below instrument detection levels (see e.g., page 21, Table 3). Applicant's barriers are particularly useful for encapsulating moisture-sensitive devices such as organic light emitting diodes. For example, by employing multiple transparent conductive oxide layers separated by polymer layers,

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applicant can avoid the cracking, crazing or delamination problems that might arise using thick transparent conductive oxide layers (see e.g., page 5, lines 2 – 9), can obtain low surface resistivity (see e.g., page 5, lines 24 – 29) and can obtain superior barrier properties (see e.g., page 5, lines 14 – 18, and Table 3 at page 21).

Rejection of claims 82,110 and 111

under 35 USC §112

Claims 82, 110 and 111 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended the objected-to phrase “less than about” in these claims and accordingly requests withdrawal of this rejection.

Rejection of claims 79, 84, 85, 87, 88, 90,

91, 98 and 101 under 35 USC §102(b)

Claims 79, 84, 85, 87, 88, 90, 91, 98 and 101 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 4,710,426 (Stephens). Stephens describes radiation control sheet materials for windows and other solar control applications. No electronic devices are shown or described in Stephens. As to independent claim 79, Stephens does not have an “electronic device on a plastic substrate”. As to independent claim 84 and dependent claims 85, 87, 88, 90, 91, 98 and 101, Stephens does not have an “electronic device on a substrate”. Applicant accordingly requests withdrawal of the 35 USC §102(b) rejection of claims 79, 84, 85, 87, 88, 90, 91, 98 and 101 over Stephens.

Rejection of claims 79, 81, 84 – 88, 92, 93,

95 – 99, 108, and 112 under 35 USC §102(b)

Claims 79, 81, 84 – 88, 92, 93, 95 – 99, 108, and 112 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 5,681,666 (Treger et al.). Treger et al. describe electrochemical cell tester moisture barriers that can contain alternating

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layers of an inorganic material and an organic material on a flexible substrate. However, Treger et al. do not as asserted in the Office Action say that the inorganic material may be "any metal oxide or mixture", and do not discuss or disclose a conductive inorganic layer. Treger et al. might in fact be expected to avoid disposing an article having conductive layers alongside their electrochemical cell, in order to avoid shorting the cell. Treger et al. exemplify only films whose inorganic layers are made from a low melting point glass, silicon dioxide or silicon nitride.

As to claims 79 and 81 and the transparent conductive oxide layers recited in claims 84 – 88, 92, 93, 95 – 99, 108, and 112, Treger et al do not describe barriers "comprising multiple layers of transparent conductive oxide". As to the transparent metal layers recited in claims 84 – 88, 92, 93, 95 – 99, 108, and 112, Treger et al. say that "the inorganic material is nonmetallic" (see col. 2, lines 52 – 53) and that "Those skilled in the art will appreciate that metal coatings are light opaque" (see col. 5, lines 35 – 36). Treger et al. do not describe barriers containing transparent metal layers and apparently assume they can not make such layers. As to the transparent conductive metal nitride layers described in claims 84 – 88, 92, 93, 95 – 99, 108, and 112, Treger et al. do not identify any specific metal nitride layer other than briefly referring to a "suitable metal nitride" and to "amorphous silicon nitride" (see col. 8, lines 21 – 23). Treger et al. exemplify only silicon nitride inorganic layers (see e.g., Examples 7 and 8). Silicon nitride can be highly resistive and usually is regarded as an insulating or dielectric film ("The most important PECVD dielectric and insulator films are used primarily in microelectronic device fabrication: silicon nitride, silicon oxide, silicon oxynitride, and silicate glasses", see *Thin Film Processes II*, edited by John L. Vossen and Werner Kern, Academic Press, page 537, a reference submitted in applicant's November 5, 2001 Information Disclosure Statement). Treger et al. do not show or enable articles containing transparent conductive metal nitride layers.

Applicant accordingly requests withdrawal of the 35 USC §102(b) rejection of claims 79, 81, 84 – 88, 92, 93, 95 – 99, 108, and 112 as being anticipated by Treger et al.

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**Rejection of claims 79, 80, 83 – 85, 87 – 90, 94, 95,
97 – 99, 104, 108, and 110 – 114 under 35 USC §102(e)**

Claims 79, 80, 83 – 85, 87 – 90, 94, 95, 97 – 99, 104, 108, and 110 – 114 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,352,777 (Bulovic et al.). Bulovic et al. describe photosensitive optoelectronic devices having organic photoconductive layers disposed between transparent electrode layers. Bulovic et al.'s devices consist of a single cell structure or a "plurality of stacked subcells" (see e.g., col. 1, lines 14 – 19) having a transparent electrode layer on their lower and upper major surfaces with organic photoconductive layers between them. Some of Bulovic et al.'s stacked cell embodiments employ intervening insulating layers made of SiO₂ or an insulating oxide, see e.g., col. 23, line 66 through col. 24, line 5 and col. 31, lines 53 – 56. As to claims 79, 80 and 83, Bulovic et al. do not disclose an electronic device on a plastic substrate having "multiple layers of transparent conductive oxide separated by one or more layers of organic dielectric polymer". As to claims 84, 85, 87 – 90, 94, 95, 97 – 99, 104, 108, and 110 – 114, Bulovic et al. do not disclose devices having "multiple layers of transparent conductive oxide, transparent metal, or transparent conductive metal nitride, separated by at least one layer of organic dielectric polymer". Also as to claims 83 and 104, Bulovic et al. disclose photosensitive devices but do not disclose an electronic device that comprises a "light emissive device". Applicant accordingly requests withdrawal of the 35 USC §102(e) rejection of claims 79, 80, 83 – 85, 87 – 90, 94, 95, 97 – 99, 104, 108, and 110 – 114 as being anticipated by Bulovic et al.

**Rejection of claims 79 – 80, 83 – 90, 94 and 104 – 107
under 35 USC §102(e)**

Claims 79 – 80, 83 – 90, 94 and 104 – 107 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,361,885 (Chou). Chou describes organic electroluminescent devices, with most of Chou's disclosure being directed to the organic electroluminescent layers. Chou briefly discusses first and second electrodes for his devices (see e.g., col. 9, line 12 through col. 10, line 33) and requires that the first and second electrodes have different work functions (see e.g., col. 9, lines 55 – 65).

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However, Chou does not discuss barriers and exemplifies only articles having a single indium tin oxide lower electrode, a conductive electroluminescent layer and a single magnesium upper electrode. As to claims 79 – 80 and 83, Chou does not disclose an electronic device on a plastic substrate with “at least one side of the device being protected from reaction with or incorporation of moisture by a composite barrier comprising multiple layers of transparent conductive oxide”. As to claims 83 – 90, Chou does not disclose an electronic device having a barrier comprising “multiple layers of transparent conductive oxide, transparent metal, or transparent conductive metal nitride, separated by at least one layer of organic dielectric polymer”. Applicant accordingly requests withdrawal of the 35 USC §102(e) rejection of claims 79 – 80, 83 – 90, 94 and 104 – 107 as being anticipated by Chou.

**Rejection of claims 82 and 110 – 111 under
35 USC §103(a) over Bulovic et al.**

Claims 82, 110 and 111 were rejected under 35 USC §103(a) as being unpatentable over Bulovic et al. According to the Office Action:

“The teachings of Bulovic et al are discussed above. Bulovic et al do not specifically teach the sheet resistance, visible transmittance and permeability properties of the composite, however, it would have been obvious to one having ordinary skill in the art at the time of the invention to determine the optimum number of layers and layer thickness to provide the desired properties including sheet resistance, transmittance and permeability of the composite barrier taught by Bulovic et al based on the desired end use.”

Applicant respectfully submits that this begs the question. With no indication in Bulovic et al. of the barrier properties of any of Bulovic et al.’s layers, and no discussion of any desired barrier properties, how could a person skilled in the art find any motivation or enablement in Bulovic et al. to make the invention of applicant’s claims 82, 110 or 111? As stated in MPEP §2143.01, “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in

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the references themselves or in the knowledge generally available to one of ordinary skill in the art." No showing of any such teaching, suggestion or motivation has been provided. Applicant accordingly requests withdrawal of the 35 USC §103(a) rejection of claims 82, 110 and 111 over Bulovic et al.

Rejection of claims 82 and 110 – 111 under

35 USC §103(a) over Chou

Claims 82, 110 and 111 were rejected under 35 USC §103(a) as being unpatentable over Chou. According to the Office Action:

"The teachings of Chou are discussed above. Chou does not specifically teach the sheet resistance, visible transmittance and permeability properties of the composite, however, it would have been obvious to one having ordinary skill in the art at the time of the invention to determine the optimum number of layers and layer thickness to provide the desired properties including sheet resistance, transmittance and permeability of the composite barrier taught by Chou based on the desired end use."

This rejection should be withdrawn for the same reasons stated above with respect to the 35 USC §103(a) rejection based on Bulovic et al.

Rejection of Claims 79 – 101, 104 – 108, and

110 – 114 for Double Patenting

Claims 79 – 101, 104 – 108, and 110 – 114 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 30 of copending Application No. 10/317,623. Applicant would be willing to submit an appropriate terminal disclaimer to overcome this rejection upon indication that claims 1 – 30 in copending Application No. 10/317,623 are allowable.

Conclusion

Applicant has made an earnest effort to address the Office Action's arguments. The cited references to Stephens, Treger et al., Bulovic et al. and Chou do not anticipate

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applicant's claimed invention. The rejections of claims 82, 110 and 111 for obviousness over Bulovic et al. or Chou have not been accompanied by an adequate showing of a teaching, motivation or enablement in these references that would lead a person having ordinary skill in the art to make the invention of these claims. Withdrawal of the rejections and passage of the application to the issue branch are requested. The Examiner is also encouraged to call the undersigned attorney if there are any questions regarding this application.

Respectfully submitted on behalf of
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